



Code: 310-77580  
Ref.: #OTS016135

JAPANESE PATENT OFFICE  
PATENT JOURNAL  
KOKOKU PATENT NO. SHO 49[1974]-20811

Int. Cl.: D 07 b 5/00  
D 04 d 9/00  
Japanese Cl.: 44 B 31  
44 C 012  
Filing No.: Sho 42[1967]-77528  
Filing Date: December 4, 1967  
Publication Date: May 28, 1974  
No. of Inventions: 1 (Total of 3 pages)

METHOD FOR MANUFACTURING RIBBON-FORM ROPE

Inventor: Teitaro Habano  
100 Minamisenzoku-cho, Ota-ku,  
Tokyo  
Applicant: Tokyo Rope Mfg. Co., Ltd.  
2-8 Muro-machi, Nihonbashi,  
Chuo-ku, Tokyo  
References Cited: Japanese Kokoku Utility Model  
No. Sho 31[1956]-19399  
Japanese Kokoku Utility Model  
No. Sho 31[1956]-10542  
Agents: Takehiko Suzue, patent attorney, and  
4 others

[There are no amendments to this patent.]

### Brief description of the figures

Figure 1 is an oblique view illustrating the [ribbon-form] twisted rope obtained in an application example of this invention. Figure 2 is a partially cut oblique view of a coated twisted rope [of wire] for forming the coated twisted rope.

### Detailed explanation of the invention

This invention pertains to a method for manufacturing a ribbon-form rope composed of a plurality of twisted ropes set side by side and integrally embedded in rubber or synthetic resin to form the ribbon shape.

As a type of special rope, this type of ribbon-form rope has been used as hoisting rope or balance rope in elevators, etc. In order to eliminate the back-twisting tendency of the conventional twisted ropes, the twisted ropes are combined to form a flat belt structure. This type of ribbon-form rope is routinely used.

As an example, twisted ropes, each of which is made of four strands free of the core strand, are set side by side to form the longitudinal twisted rope group. Then, in the width direction, lateral wires are set and inserted through the core portions of the four-strand twisted ropes to form a knitted zigzag configuration as the ribbon-form rope. However, this knitting operation requires manual operation, and it has a low efficiency. When this method is adopted in manufacturing the long ribbon-form ropes for use in the elevators of pits of coal mines, much labor and time are needed.

Even when the aforementioned ribbon-form rope is manufactured with much man-hours, because lateral wires are used to knit the longitudinal twisted rope group, the longitudinal twisted ropes have to be made of four strands so that there is no core strand. As the twisted ropes have little strand gap and have a high rigidity, and they are knit tightly to each other, the obtained ribbon-form rope has poor softness and a very high rigidity. Consequently, when the ribbon-form rope is used as the balance rope that hangs in the lower portion for connecting elevators that may be ascending/descending alternately, the high rigidity leads to a tendency of bulging of the rope instead of the normal bending state. Consequently, the aforementioned bulging portion may make contact with the wall surface of the narrow pits of coal mines, leading to accidents of collapse of the wall surface of the pit, or, even when no accident takes place, it still causes unstable up/down movement of the elevators. This is undesired. Also, for the ribbon-form rope prepared by knitting with lateral wires, the lug portions of the lateral wires become the object of wear. Consequently, the lifetime of the ribbon-form rope becomes shorter. In this case, when on-site repair is performed, the aforementioned knit structure leads to significant difficulty in performing a complete on-site repair.

The purpose of this invention is to solve the aforementioned problems of the conventional technology by providing a type of ribbon-form rope characterized by the fact that it makes unnecessary the man-hours needed for the manual knitting operation, allows mass production, and permits selection at will of the flexibility, rigidity, and other properties as well as various specifications of the ribbon-form rope body. Also, the ribbon-form rope of this invention has a high wear resistance, a high corrosion resistance, and a long service life.

In the following, an application example of this invention will be explained with reference to figures. As shown in Figure 2, first of all, several steel strands are twisted in an S-twist or Z-twist to form a plurality of wire twisted ropes (1). For each twisted rope (1), the outer periphery is coated with a flexible material, such as rubber or a synthetic resin material to form coating layer (2), forming coated twisted ropes (3). Said coated twisted ropes (3) are aligned and set side by side with the S-twist and Z-twist arranged alternately, as shown in Figure 1. Then, each contact portion is bonded as explained below to form ribbon-form rope (4) with a specified width. That is, heat treatment is performed to soften coating layer (2), so that coated twisted ropes (3) are fused to each other.

As explained above, twisted ropes (1) can be prepared as the raw material from strands made of various materials and with different specifications. Also, the desired coating material may be selected for coating said twisted ropes (1) to form coating layer (2), forming coated twisted ropes (3). Then, depending on the requirements of the specific use, several groups of the twisted ropes are set side by side and bonded to each other by the aforementioned means. Consequently, it is possible to select the length, width and thickness of the ribbon-form rope as needed in manufacturing to form the desired ribbon-form rope. It differs from the aforementioned manual operation method in that the production is easy, mass production can be carried out, and the ribbon-form rope of this invention has higher wear resistance and corrosion resistance than the conventional products. Also, because twisted ropes (1) are laid only in the longitudinal direction of the ribbon-form rope body, and they are embedded integrally in the coating material. The ribbon-form rope of this invention differs from the aforementioned knit-type flat rope in that it has appropriate softness, flexibility, and rigidity. Also, as explained in the above, by selecting [properties] beforehand, the desired ribbon-form rope can be manufactured in a relatively easy way.

Also, because the ribbon-form rope is formed by setting the coated twisted ropes with their twisting directions arranged alternately, the back-twisting tendencies of the neighboring wire twisted ropes cancel each other, so that the internal stress of the ribbon-form rope can be eliminated.

Claim

A method for manufacturing ribbon-form rope characterized by the fact that it is comprised of the following steps: a step in which a layer of rubber, synthetic resin or other flexible material in a specified thickness is coated on the outer layer of twisted ropes of wire to form coated twisted ropes; and a step in which the coated twisted ropes are set side by side in contact with each other, with the twisting directions of the twisted ropes of wire set alternately, and the contact portions are fused to form a ribbon-form body with the desired width and length.

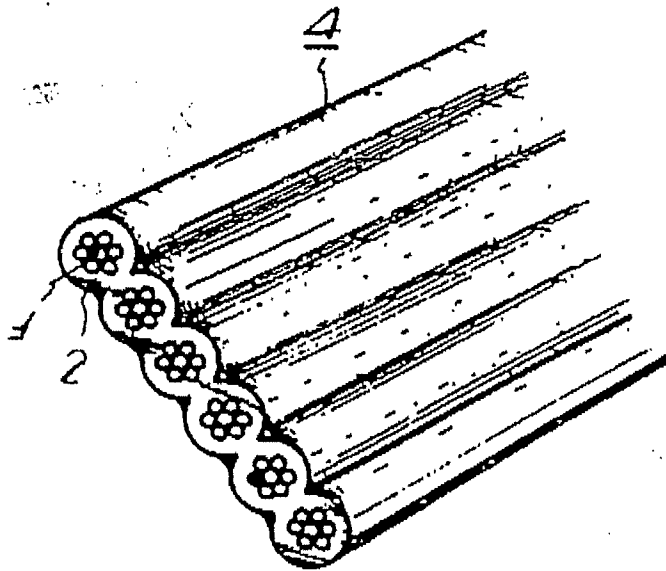


Figure 1

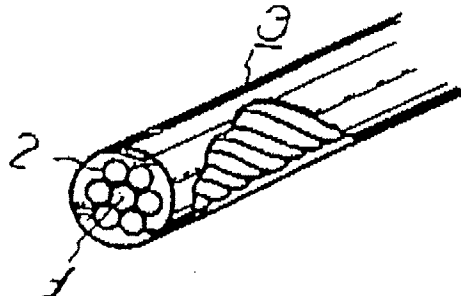


Figure 2

DERWENT-ACC-NO: 1974-46289V  
DERWENT-WEEK: 197425  
COPYRIGHT 1999 DERWENT INFORMATION LTD

TITLE: Flat rope prodn - by contacting twisted strands coated with flexible material and melting the coating at the contact points

PATENT-ASSIGNEE: TOKYO ROPE MFG CO(TORM)

PRIORITY-DATA: 1967JP-0077528 (December 4, 1967)

PATENT-FAMILY:

PUB-NO  
JP 74020811 B

PUB-DATE  
May 28, 1974

LANGUAGE  
N/A

PAGES  
000

MAIN-IPC  
N/A

INT-CL\_(IPC): D07B005/00

ABSTRACTED-PUB-NO: JP74020811B

BASIC-ABSTRACT: The flat rope has superior flexibility, rigidity and corrosion resistance and is suitable for hoisting cargo. Several wires are twisted into an S or Z twist strands then the strand is covered with a flexible material such as rubber or synthetic resin. The coated strands are arranged in parallel and in contact with each other so that the S twist coated strands and the Z twist coated strands are placed alternately. Finally the S and Z twist coated strands are bonded together by melting their contact parts so that a flat rope is obtd.

TITLE-TERMS:

FLAT ROPE PRODUCE CONTACT TWIST STRAND COATING FLEXIBLE MATERIAL MELT COATING CONTACT POINT

DERWENT-CLASS: F02

CPI-CODES: F01-H01; F04-A;

## 特 許 公 報

昭49-20811

⑬ 公告 昭和 49 年(1974) 5 月 28 日

発明の数 1

(全 3 頁)

1

2

## ⑭ 帯索の製造法

- ⑮ 特 願 昭 4 2 - 7 7 5 2 8  
⑯ 出 願 昭 4 2 ( 1 9 6 7 ) 1 2 月 4 日  
⑰ 発 明 者 梶野 禎 太 郎  
東京都大田区南千束町 1 0 0  
⑱ 出 願 人 東京製綱株式会社  
東京都中央区日本橋室町 2 の 8  
⑲ 代 理 人 弁理士 鈴江武彦 外 4 名

## 図面の簡単な説明

第 1 図は本発明法の一実施例によつて得られた帯索の斜視図であり、第 2 図は、この帯索を構成する被覆燃索の一部切欠斜視図である。

## 発明の詳細な説明

本発明は互いに並列する複数組の燃索をゴム、合成樹脂材で一体に被覆埋入し帯状を形成する帯索の製造法に関するものである。

特殊ロープとして、例えば捲上用索引索や昇降機のバランスロープなどに使用されるこの種帯索は、通常の燃索の示す捻回性を除去するために、特にこれらを組合わせ扁平なベルト状構造をとり、後記のような帯索が従来採用されている。

すなわちその一例を挙げれば芯ストランドのない 4 本合わせ燃索を並列させた長手方向の燃索群に対し、その巾方向に横ワイヤを配し、この横ワイヤを各 4 本合わせ燃索の芯部に挿通していき全体を千鳥状に編組して製作する方法がとられている。しかしながらこの編組作業は専ら手作業によつて得られるものであるため、非常に非能率的であるし、またこのような手作業で炭鉱の立坑用昇降機に使用する長尺の釣合帯索などを製作すると、これに要する労力、時間はおびただしいものとなる。

またさらに帯索はこのような手間をかけて得られるが、上述のように横ワイヤを使用して長手方向の燃索群を編組していく関係上、燃索には芯ス

ストランドのない燃索、すなわち 4 本合せのような構造のものを使用せざるを得ないが、このようなストランド間隙が少なく剛直性の大な燃索を使用し、かつこれらが型固に組合い編組されているため、柔軟性に乏しく、剛直性が非常に強く、したがって例えば相互に昇降する昇降機を連結してその下部に懸垂される釣合索などに使用した場合には、その剛直性のために正常な屈曲状態を呈さず外方に膨出する傾向が強い。このため炭鉱などの狭い立坑では、その壁面に上記膨出部が触れ、壁面の崩壊事故を招くし、また事故に至らないまでも昇降機の上下動をいちじるしく不安定なものにするという難点があつた。さらに縦ワイヤ群を編組する横ワイヤの耳部が使用中摩滅損耗の対象となり、その耐用年限はいちじるしく短縮されるが、このような場合、その損耗箇所を補修しようとしても前記のような編組構造では現地における完全修理など到底困難である。

本発明は以上のような従来法の欠陥、不利点を改善するべく着目したもので、まず手編み作業のような労力、手間を全く省き、量産可能に製造することができ、かつ帯索自体の可撓性、剛性などの性能および各種規格のものもその製作時に随意選定することができるような製造法を開発し、あわせて耐磨耗性、耐蝕性に富む耐用年限の長い帯索を提供することを目的とする。

以下本発明を図示の一実施例に基づいて説明すれば、第 2 図に示すように、まず複数本の鋼索線を S 燃および Z 燃に燃合してなる複数本のワイヤ燃索 1... を形成し、各燃索 1... の外周に可撓性材料、たとえばゴム、合成樹脂材料の被覆層 2 を形成して被覆燃索 3... を得る。これらの被覆燃索 3... を、S 燃のものと Z 燃のものとが交互になるように引揃えて第 1 図に示すごとく相接並列させ、各接触部ごとを以下のように接合して所定巾をもつ一連の帯索 4 を得る。すなわち、熱処理により被覆層 2 を軟化させて、各被覆燃索 3... の相互を

融着させる。

以上のようにすれば、燃焼造使用する素線の材質などについて種々規格の異なる燃索1を原材料とし、また同様にその材質について選定した所望の被覆材料を使用、上記燃索1に応じた被覆層2をほとして被覆燃索3を製作しておき、これらを使用条件に応じて被覆層、並列組合わせたのち、前記手段で相互に接合する。したがってその長さ、巾、厚さなどは製作時いかようにも選定することができ、所望の帯索を得ることができる。しかも上記方法によれば、前記手作業による従来法と異なりその製作は常に容易であり、充分量産可能であるし、また得られる帯索も従来品に比して耐摩耗性、耐蝕性に優れ、しかも帯索本体の長手方向のみを貫通する燃索1…と、これを一体に被覆埋入した被覆材とで構成されているから前記編組タイプのフラットロープと異なり、柔軟性、可撓性と適度の剛性を示し、またこれらは前記のように製作当初において予め選定することによりどのよ

うな所望の帯索も比較的容易に得ることか  
また、ワイヤ燃索の燃方向が異なる被覆交互に配列して帯索を構成したから、各々索の捻回性が相殺され、帯索の内部応力の5 図れる。

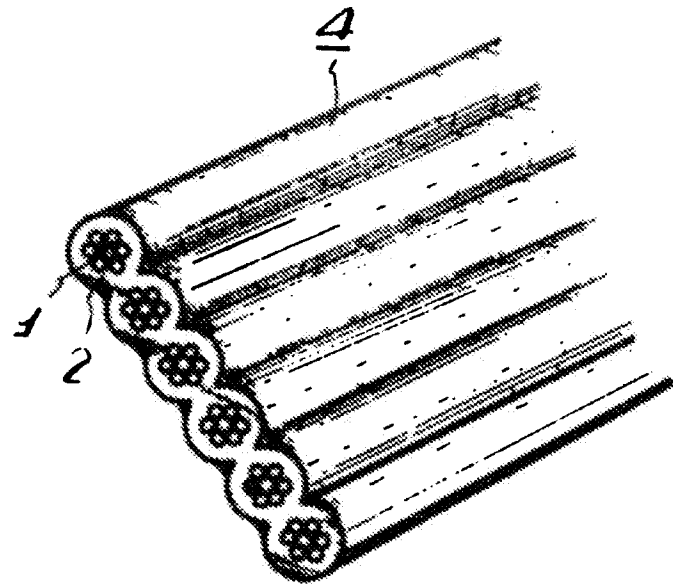
#### ⑦特許請求の範囲

1 ワイヤ燃索の外層にゴム、合成樹脂の可撓性材料を所定の厚さに被覆して被覆燃成する工程と、これら被覆燃索をそのワイ燃方向が交互に異なるように相互に接触並各接触部を融着して所望の巾および長さから一連の帯状体を形成する工程とからなることとを特徴とする帯索の製造法。

#### ⑧引用文献

実 公 昭31-19399  
実 公 昭31-10542

第1図



第2図

